Version 02

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Data Conversion Strategy Plan

Prepared for

The Office of the Under Secretary of Defense

Personnel and Readiness

And

The Defense Manpower Data Center

11 January, 2001

Developer's Representative Signature	Date
Acquirer's Signature	Date

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1. Scope

1.1. Purpose

This document describes the strategic plan to reconcile, convert, and migrate medical related data from the Defense Enrollment Eligibility Reporting System (DEERS), both the old eligibility and 2.0 versions, to DEERS 3.0 in support of the New Medical redesign effort. It also includes the reconciliation, conversion, and migration of data from sources outside DEERS into DEERS 3.0.

This document details the following:

- Data to be converted
- Data and process flows
- Testing approach
- Reports produced during conversion
- Responsible parties

It does not address the migration of person, personnel, or benefits data. The movement of this data into DEERS 3.0 will occur through direct loads from the Oracle tables of DEERS 2.0.

1.2. Overview

1.2.1. System Overview

The primary mission of the existing DEERS is to reduce the fraud and abuse of Department of Defense (DoD) benefits while ensuring that beneficiaries receive the benefits they are entitled. Through various systems that interface with DEERS, users access medical, dental, and insurance information. Each system performs distinct tasks; however, all query the DEERS database for information pertaining to the benefits determination for active duty and retired members of the Army, Navy, Marine Corps, and Air Force, their family members, and their survivors. In addition, legislative actions authorize the provision of health care to DoD, United States Coast Guard (USCG), United States Public Health Service (USPHS), and National Oceanic and Atmospheric Administration (NOAA) personnel. This broad system of reciprocal health care delivery is referred to as the Military Health System (MHS).

Currently, DEERS interacts with the following entities within the MHS community:

- Composite Health Care System (CHCS)
- Managed Care Support Contractors (MCSCs)/Claims Processors
- Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) Fiscal Intermediaries (FIs)
- Designated Providers, formerly known as Uniformed Service Treatment Facilities (USTFs), now referred to as Uniformed Services Family Health Plan providers (USFHPs)
- Health Benefits Advisors and other users throughout the continental United States (CONUS) and outside of the continental United States (OCONUS) via the Government Inquiry of DEERS (GIQD) application
- Base Realignment and Closure (BRAC) Pharmacy benefit program contractors
- Continued Health Care Benefit Program (CHCBP) administrator
- DoD Mail Order Pharmacy benefit program contractor

DEERS users also include the Defense Manpower Data Center (DMDC) Support Office (DSO) Telephone Center, the Armed Forces Institute of Pathology (AFIP), and other approved users.

The goal of DEERS 3.0 is to migrate some of the functionality within the existing DEERS to a new DEERS data model, supporting the MHS Health Functional Architecture as well as additional functional requirements.

The new data model is focused on the concept of "a Person." Under the existing DEERS, data on family members is keyed to and retrieved via the sponsor's Social Security number (SSN). The new data model will store and retrieve this information via each individual beneficiary's SSN, while defining the beneficiary's relationship to the sponsor in separate data fields. Each beneficiary is therefore regarded as an individual person rather than as a sponsor or, in effect, an attachment to a sponsor.

DEERS is being redesigned as an integrated system consisting of a database; rules for benefits and entitlements eligibility determination and data reconciliation; a set of functional applications; and interfaces to other systems, as required. The database is an Oracle Relational Database Management System (RDBMS). An expert system, AionDS, will be used to code and store the DEERS business rules.

The redesigned and expanded DEERS will continue to be the MHS central source for personnel information from the DoD personnel community. In addition, DEERS will continue to be the source for determining DoD medical benefits.

DEERS 3.0 will support current functionality and new requirements requested by the MHS community, as categorized below:

- Maintain Health Care Delivery Program (HCDP) information
- Support Claims Processing or maintain Standard fiscal year and Prime enrollment year catastrophic cap and deductible (CC&D)
- Perform Eligibility verification
- Maintain Non-availability Statements (NAS)
- Maintain Person information
- Maintain specified Immunization information
- Maintain Standard Insurance Table (SIT) information
- Maintain Other Health Insurance (OHI) information
- Provide reports

DEERS will interface with the MHS community through two primary sources: Electronic Data Interchange (EDI) transactions and a DEERS client application. Systems external to the MHS that request information from DEERS will be required to communicate via EDI message structures. DEERS will also provide a client application containing the functionality required to support the non-EDI MHS community.

1.2.2. Data Conversion Overview

Data conversion provides the means to transfer data from an existing environment to a new environment. The DEERS 3.0 assimilates vast quantities of data from previously isolated entities and encapsulates it; thereby providing true portability of health care. The movement to this new data model will require consolidation of data from multiple sources: DEERS old eligibility, DEERS 2.0, CHCS, the MCSCs, TRICARE Management Activity (TMA)-Aurora, and Birch & Davis Associates (B&D). These entities hold the following data to be converted:

- DEERS 2.0:
  - Person
  - Personnel
  - Benefits

- DEERS old eligibility:
  - Current alternate (alt-) care
  - Alt-care history
  - NAS
- CHCS:
  - OHI
  - Primary Care Manager (PCM) selection, including PCM Identifiers
- MCSCs:
  - Enrollment
  - Fee Payment
  - Prime enrollment year (CC&D)
- TMA-Aurora:
  - Central Deductible and Catastrophic Cap file (CDCF) for Standard fiscal year CC&D
- B&D:
  - The SIT

With all of these entities working in tandem, much coordination and attention to logistics is required to successfully migrate to DEERS 3.0. This document addresses the overall strategy for accomplishing the DEERS 3.0 migration. Individual data conversion specification documents will provide a detailed schematic for the migration of each of the various data entities.

Given the complexity of the task, it is assumed that the migration to DEERS 3.0 will require multiple iterations of conversion program prototypes during each stage of testing. This is typical for data conversion – repeated cycles of producing export files, reconciling and converting the data, diagnosing errors, generating exception/error reports, researching exceptions, and cleaning up the data. As these iterations progress, changes may need to be made to program logic to respond to knowledge gained in the detailed analysis of the results. The MCSCs will be responsible for supporting this process by providing test files and assistance in researching errors.

Within each iteration, the migration task can be broken down into the following phases:

- Export Phase
- Reconciliation Phase
- Conversion Phase
- Import Phase

These phases will be duplicated for each of the following data entities:

- HCDP
- NAS

- CC&D
  - Standard Fiscal Year
  - Prime Enrollment Year

The SIT migration will contain all of the above steps except for the Reconciliation Phase.

1.2.2.1. Export Phase

The Export Phase involves the export of existing data to sequential files. The format of theses sequential files will be defined by DEERS and are documented in the DEERS/MHS HCDP Data Conversion Specifications, the DEERS/MHS Standard Fiscal Year CC&D Data Conversion Specifications, the Prime Enrollment Year CC&D Data Conversion Specifications, and the SIT Data Conversion Specifications. These export files contain the data to be converted, though at this point still in its old format.

1.2.2.2. Reconciliation Phase

A Master Key file (refer to Figure 1 for a data flow diagram) will be used to associate the records in the export files with the appropriate DEERS 3.0 keys (specifically, the DEERS Identifier and DMDC Identifier), so that the information can be properly targeted to the correct records on the DEERS 3.0 database. This procedure is part of the Reconciliation Phase. In addition, the Reconciliation Phase may also involve the merging of multiple data sources, such as in the HCDP conversion, where DEERS old eligibility alt-care data and the MCSCs' enrollment data are reconciled with the assigned HCDP data.

1.2.2.3. Conversion Phase

In the Conversion Phase, existing data will be mapped field-by-field to the table formats of the new database. Each data element will be evaluated to determine its place in the new system. This may require a conversion, or may be a direct move. Some conversions will entail translating an existing valid value to a new valid value. Others will involve combining current fields into one new field, or splitting one current field into several new fields. The explicit details of the mappings will be spelled out in the data conversion specification documents.

The conversion programs will take the sequential files generated in the Reconciliation Phase, perform any necessary conversions, and migrate the data to sequential import files that replicate, in form, the relevant Oracle tables in DEERS 3.0. In addition to creating the import files, the conversion/migration programs will generate both exception and statistical reports that will be used in researching any problems that arise with the data.

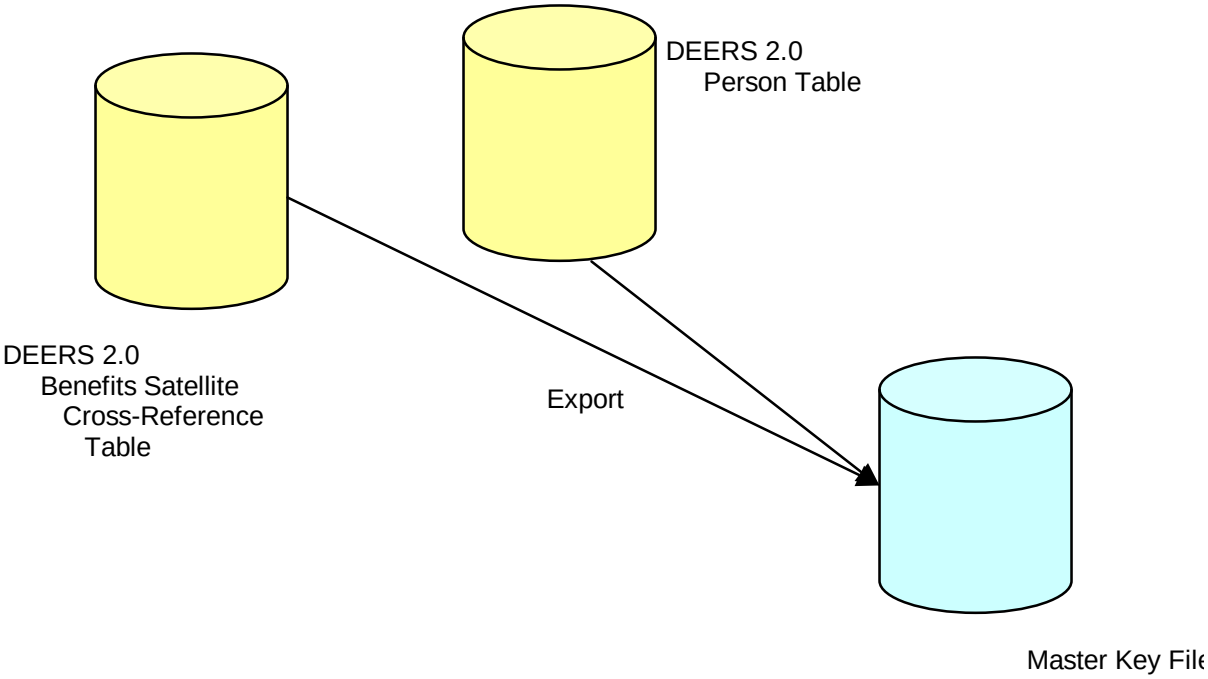

Figure 1 – Creation of Master Key File

1.2.2.4. Import Phase

The Import Phase involves loading the sequential import files into the Oracle tables in DEERS 3.0. After loading, the data will be validated using SQL scripts.

1.2.3. Objective

The objective of the DEERS 3.0 conversion is to successfully reconcile, convert and migrate all DEERS data from its current source (whether DEERS old eligibility, DEERS 2.0, or an outside entity such as CHCS, the MCSCs, or TMA-Aurora) to its proper format and place in the redesigned DEERS 3.0. Further, all beneficiaries with records on the DEERS 3.0 database who are not enrolled in a health care program will be correctly assigned HCDP records that reflect the appropriate coverage plan to which they are entitled.

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2. Referenced Documents

"DEERS/Medical Interface Operational Description, Version 13," dated 19 March 1999.

"DEERS/Medical System/Subsystem Requirements Specification," dated September 1998.

"Defense Enrollment Eligibility Reporting System Data Dictionary," dated 2 November 1998.

DEERS Data Model, "Benefits View of the E2R2 Database, Version 13," dated 29 March 1999.

DEERS Data Model, "Benefits Satellite Database, Version 13," dated 19 March 1999.

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3. Data to be Converted

This section provides information on the sources, targets, and processes involved in the data conversion. In addition, it details all required data precedence issues.

3.1. Health Care Delivery Program (HCDP)

3.1.1. Sources

Data for the HCDP migration will come from the following sources:

- DEERS 3.0 keys
- DEERS 2.0 benefits
- DEERS old eligibility alt-care and alt-care history
- MCSC enrollment and fee payment data (current enrollment year only)

Migration of active duty HDCP information from CHCS is not required, for DEERS is considered the most current source for such data.

3.1.2. Targets

The following references pertain to tables in DEERS 3.0:

- The HCDP table contains data on a beneficiary's Health Care Delivery Program. Records will exist for the entire length of eligibility. Each record will represent either an enrolled or assigned coverage plan.
- The HCDP Enrollment table contains data related to a beneficiary's current enrollment period. Only one record will exist per beneficiary, representing the most current enrollment.
- The Prime Family Enrollment Year table holds the Enrollment Anniversary Calendar Date for a family. Only one Anniversary Date will exist per family, per 12-month period.
- The HCDP Fee Payment table contains data associated to HCDP enrollment fees. Fee payments are tracked at the family level, though multiple records may be associated to a family enrollment year.

3.1.3. Process

The migration of HCDP-related data to DEERS 3.0 will involve the following procedures[1] (refer to Figure 2 and Figure 3 for the process flow and data flow diagrams, respectively):

1. Export keys from DEERS 3.0 to a Master Key file (DEERS DBA).
2. Export DEERS old eligibility alt-care and alt-care history data to sequential export files (conversion SE).
3. Export current MCSCs' enrollment data to sequential export files (PGBA, WPS).
4. Export current MCSCs' fee payment data to sequential export files (PGBA, WPS).
5. Export DEERS 2.0 benefits tables to sequential files (DEERS DBA).
6. Reconcile DEERS 3.0 keys with DEERS old eligibility data and MCSCs' data (conversion SE).
7. Determine assigned HCDP based on a benefits analysis algorithm to establish baseline coverage (conversion SE).
8. Determine DEERS enrolled HCDP using DEERS alt-care data (conversion SE).
9. Reconcile DEERS alt-care and alt-care history data, MCSC enrollment data, and assigned HCDP data and convert to HCDP format (conversion SE).
10. Generate error report files[2] (conversion SE).
11. Error research and resolution (conversion SE, MCSCs).
12. Create sequential output files for MCSCs, including any changes made to their data due to discrepancies with DEERS or between regions (conversion SE).
13. Create sequential import files in the format of the DEERS 3.0 tables (conversion SE).
    - Create one HCDP record per beneficiary for the entire length of enrollment in a coverage plan.
    - Create one HCDP Enrollment record per beneficiary for the current enrollment.
    - Create a PCM Selection record for each time the beneficiary changes DMIS IDs. Note that these PCM Selection records will not contain PCM IDs.
    - Create one Prime Family Enrollment Year record per family, based upon current enrollment.
    - Create a HCDP Fee Payment record for each fee payment made by a family during the current enrollment year.

[1] **Party responsible for procedure is listed in parenthesis after each step.**

[2] **Error reports will be generated at multiple points in the HCDP migration process.**

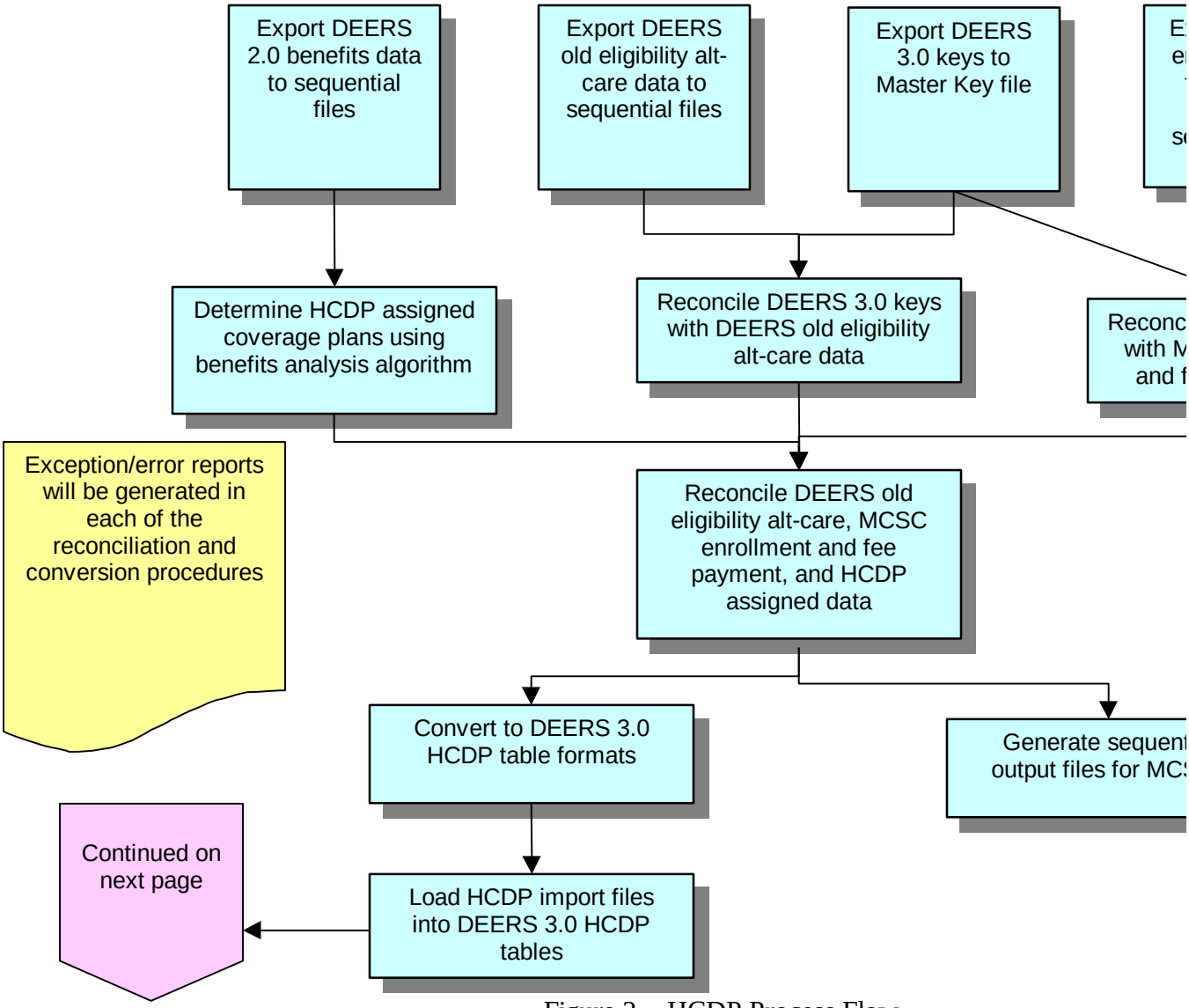
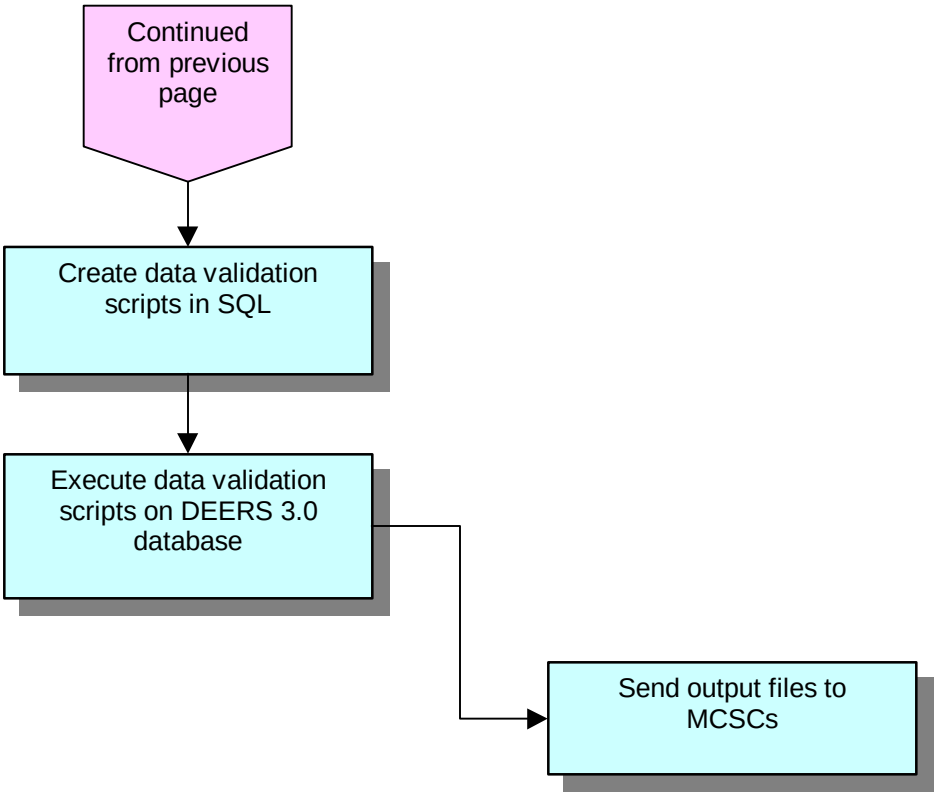


Figure 2 – HCDP Process Flow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Create data validation scripts in SQL
Execute data validation scripts on DEERS 3.0 database
Send output files to MCSCs

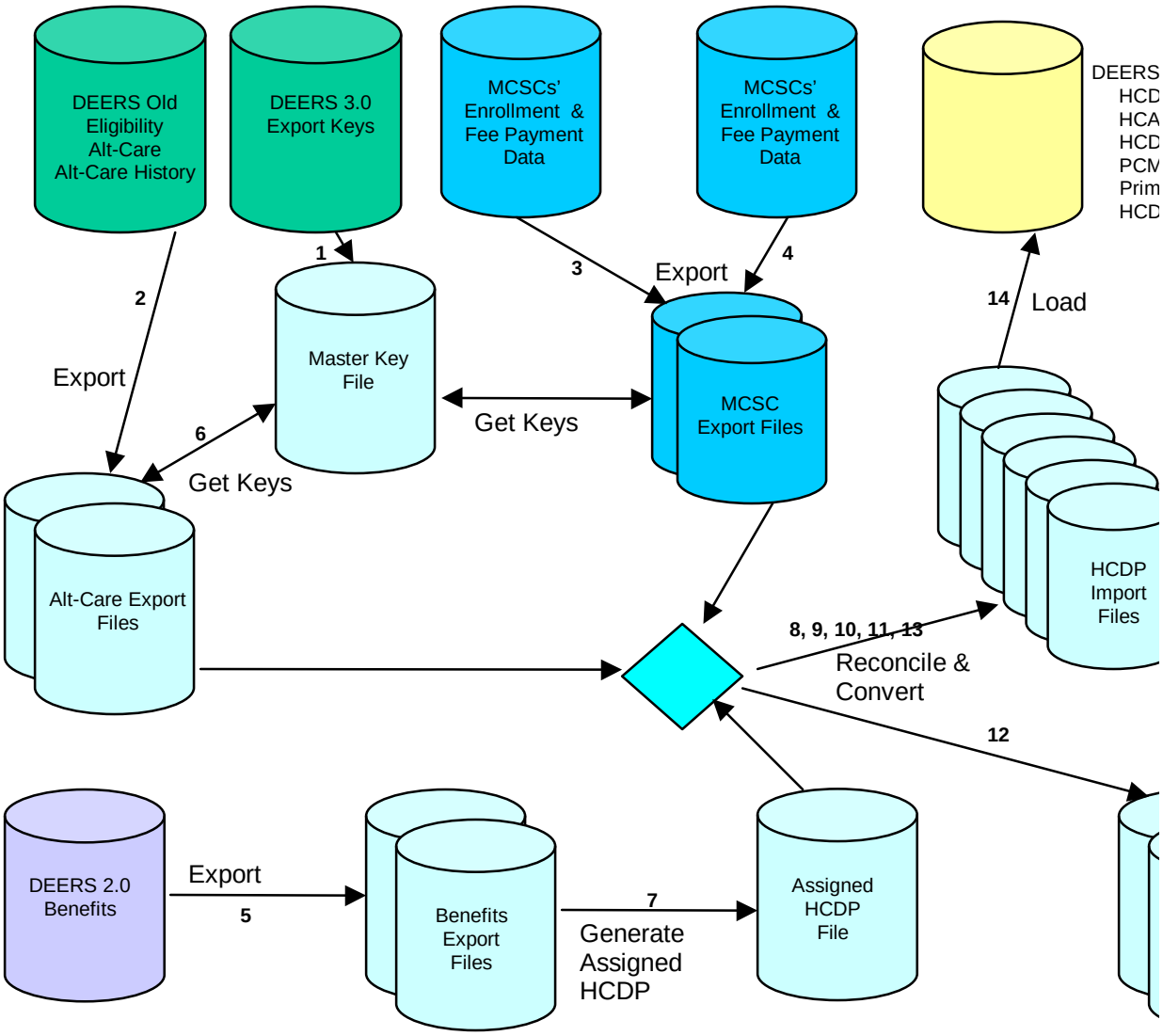


Figure 3 – HCDP Data Flow

14. Load the import files into the DEERS 3.0 tables (DEERS DBA).

Once the load step is finished, the following steps will occur.

- Execute data validation scripts on DEERS 3.0 database tables after loading import files (conversion SE).
- Research and resolve any discrepancies found in results from execution of data validation scripts (conversion DE, DEERS DBA, MCSCs).
- Execute delta change procedures to update DEERS 3.0 database with any changes that occur between the time of the conversion and the point at which DEERS 3.0 goes live (DEERS DBA). Analysis of delta change methodology and responsibilities is ongoing.
- Send import and output files to MCSCs (conversion SE).

3.1.4. Precedent Requirements

The following are required load precedents for DEERS 3.0 HCDP-related data:

- A beneficiary must exist in the DEERS 3.0 database before any HCDP records can be loaded and associated to them.
- A beneficiary must have an HCDP record before an HCDP Enrollment or PCM Selection record can be loaded and associated to them.
- A family must have a Prime Family Enrollment Year record before HCDP Fee Payment records can be loaded and associated to them.

3.2. Primary Care Manager (PCM)

3.2.1. Source

CHCS is the source for PCM data.

3.2.2. Target

The PCM Selection table represents the PCM selections of a beneficiary. Multiple records may be associated to each HCDP record.

3.2.3. Process

No initial load of PCM Selection data from CHCS will be performed. This data will be loaded into DEERS 3.0 as it comes in upon a beneficiary's enrollment. The PCM lookup table will be loaded in the same manner.

3.2.4. Precedent Requirements

A beneficiary must have an HCDP record before a PCM Selection record can be loaded and associated to them.

3.3. Non-availability Statement (NAS)

3.3.1. Source

The NAS file in DEERS old eligibility (VDSDF.JELCI.YDDFNASP) is the source for all DEERS 3.0 NAS data.

3.3.2. Target

The NAS table in DEERS 3.0 contains information on Non-availability Statements issued to persons on the DEERS database.

3.3.3. Process

The migration of NAS data to DEERS 3.0 will involve the following procedures (refer to Figure 4 and Figure 5 for the process flow and data flow diagrams, respectively):

1. Export keys from DEERS 3.0 to the Master Key file (DEERS DBA).
2. Export DEERS old eligibility NAS data to a sequential export file (conversion SE).
3. Reconcile DEERS 3.0 keys to DEERS old eligibility NAS data (conversion SE).
4. Convert DEERS old eligibility NAS data to DEERS 3.0 NAS format (conversion SE).
5. Generate error report files (conversion SE).
6. Error research and resolution (conversion SE, CHCS).
7. Create a sequential import file in the format of the DEERS 3.0 NAS table (conversion SE).
8. Load the import file into the DEERS 3.0 NAS table (DEERS DBA).

Once the load step is finished, the following steps will occur.

- Execute data validation scripts on DEERS 3.0 database tables after loading the import file (conversion SE).
- Research and resolve any discrepancies found in results from execution of data validation scripts (conversion SE, DEERS DBA, MCSCs).
- Execute delta change procedures to update the DEERS 3.0 database with any changes that occur between the time of the conversion and the point at which DEERS 3.0 goes live (DEERS DBA). Analysis of delta change methodology and responsibilities is ongoing.

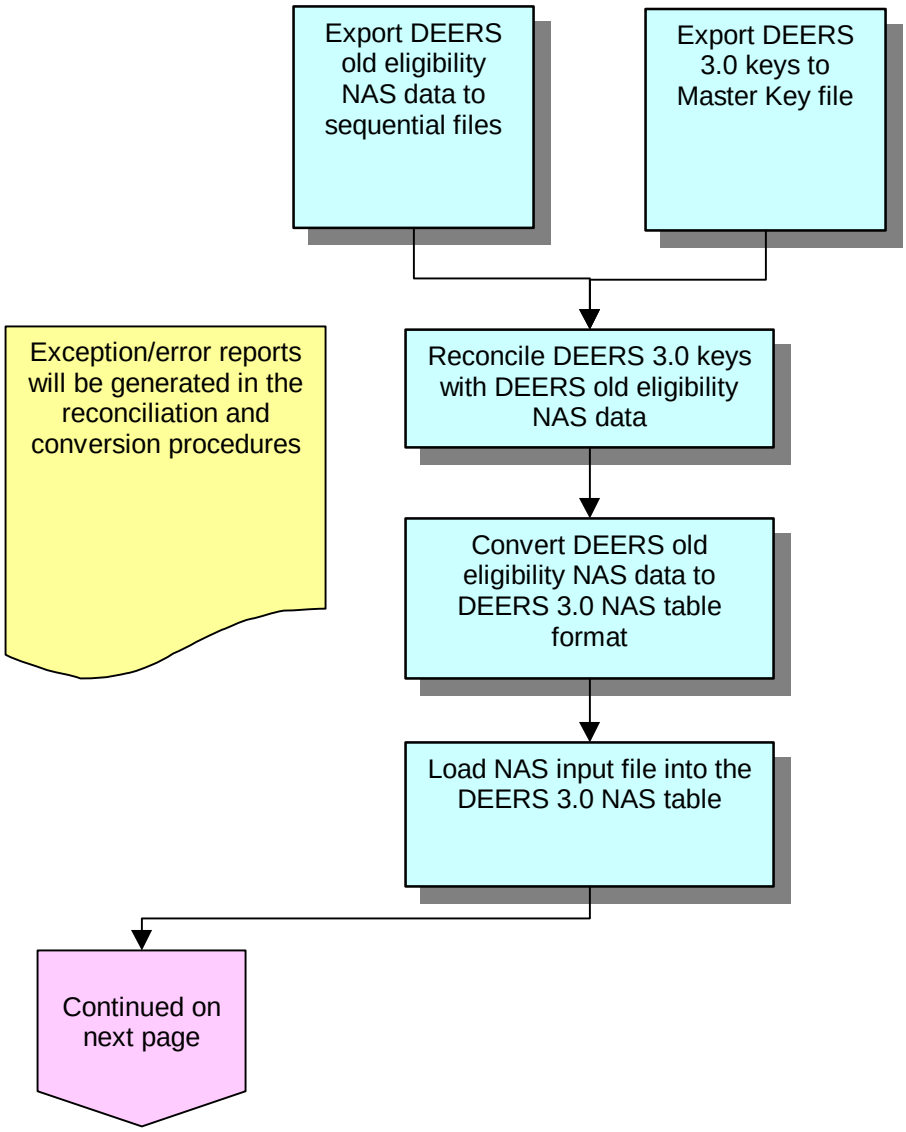
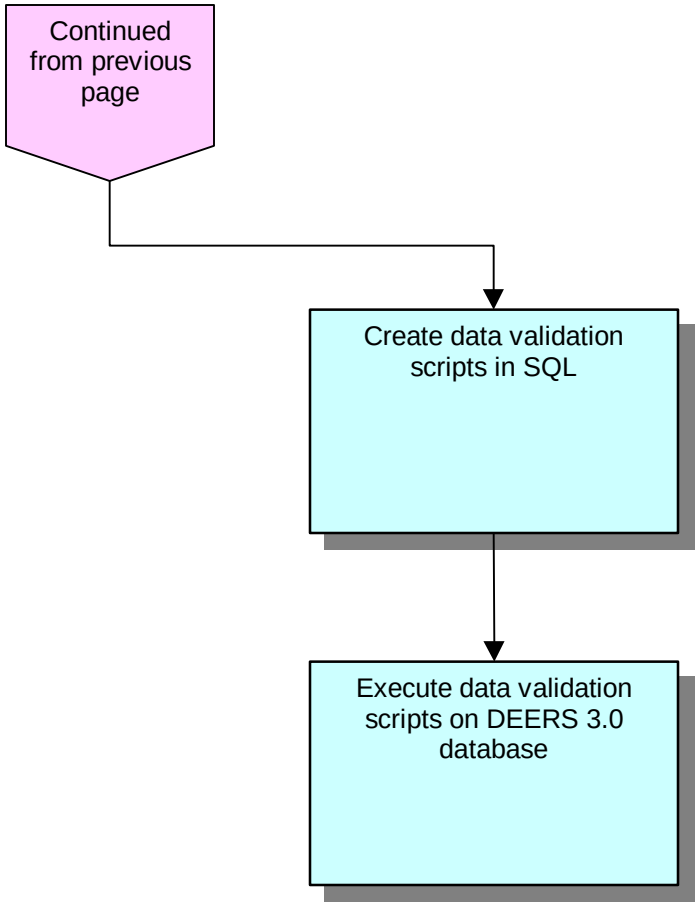


Figure 4 – NAS Process Flow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Create data validation scripts in SQL
Execute data validation scripts on DEERS 3.0 database

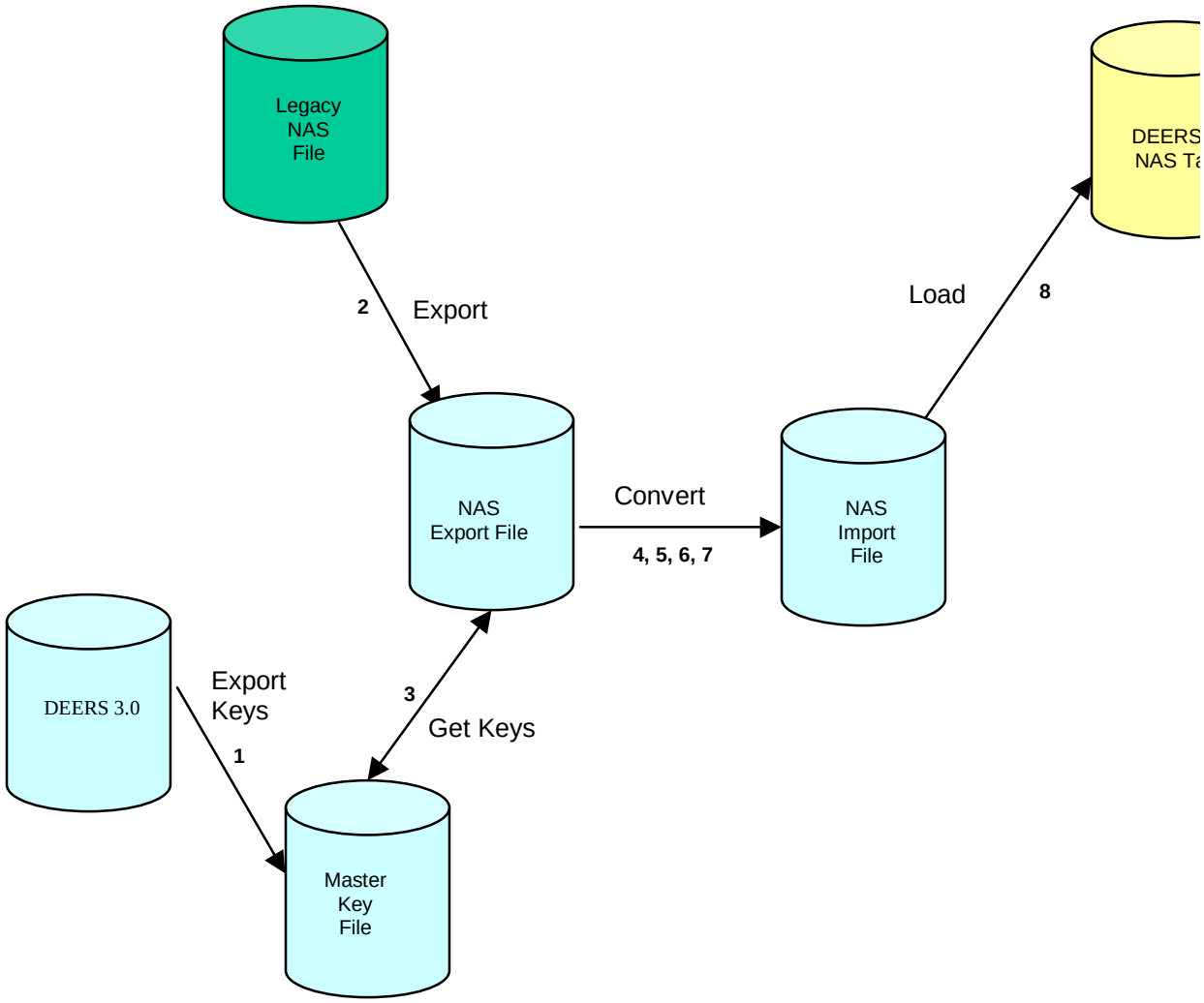


Figure 5 – NAS Data Flow

3.3.4. Precedent Requirements

A person must exist in the DEERS 3.0 database before a NAS record can be loaded and associated to them.

3.4. Standard Insurance Table (SIT)

3.4.1. Source

B&D will provide a file containing SIT data.

3.4.2. Target

The SIT, also known as the Other Health Insurance Carrier table in DEERS 3.0, is a lookup table that provides a standardized means for identifying each insurance company used within the third-party collections program and claims management activities of the DoD.

3.4.3. Process

The loading of SIT data into DEERS 3.0 will involve the following procedures (refer to Figure 6 and Figure 7 for the process flow and data flow diagrams, respectively):

1. Export B&D SIT data to sequential file (B&D)
2. Convert B&D SIT data to the DEERS 3.0 SIT format (conversion SE).
3. Send the SIT file to CHCS (conversion SE).
4. Send the SIT file to the MCSCs (conversion SE).

Once the load step is finished, the following steps will occur.

- Execute data validation scripts on DEERS 3.0 database tables after loading the import file (conversion SE).
- Research and resolve any discrepancies found in results from execution of data validation scripts (conversion SE, DEERS DBA, MCSCs).

3.4.4. Precedent Requirements

There are no precedent requirements for the initial load of the SIT into DEERS 3.0.

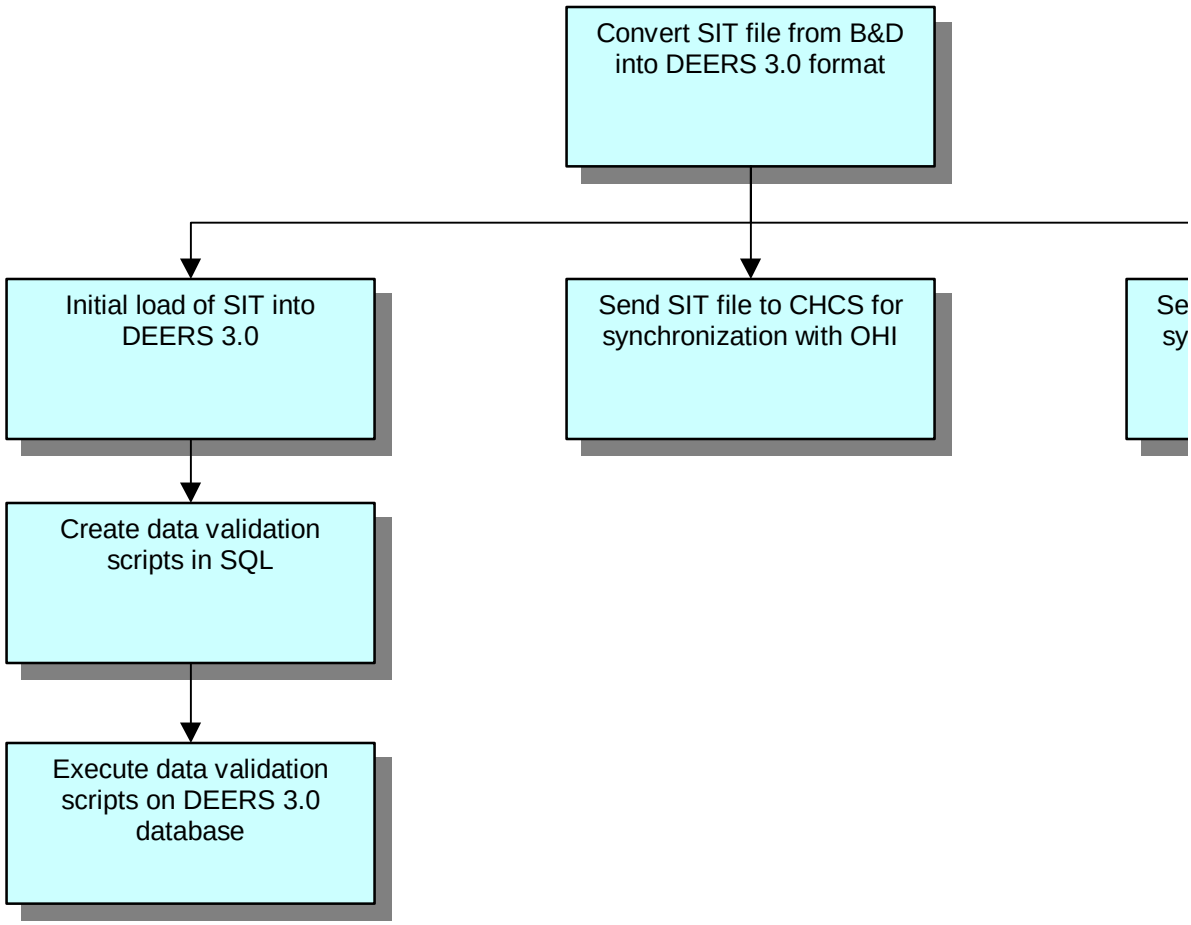


Figure 6 – SIT Process Flow

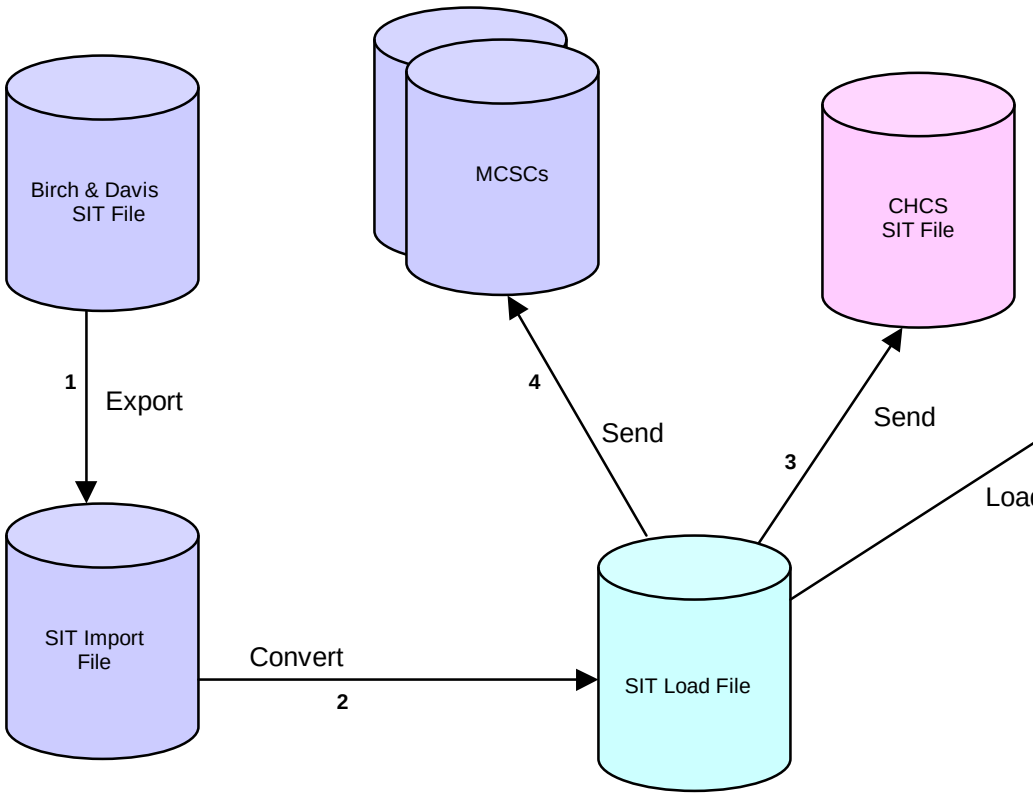


Figure 7 – SIT Data Flow

3.5. Other Health Insurance (OHI)

3.5.1. Source

CHCS will provide the OHI data for DEERS 3.0. OHI data will not be supplied by the MCSCs because they do not collect complete OHI information.

3.5.2. Target

The OHI table in DEERS 3.0 contains OHI (commercial insurance) data associated to persons in the DEERS database. It provides a standard means for collecting insurance information to support the DoD third-party collection by the MTFs and claims management activities.

3.5.3. Process

No initial load of OHI data from CHCS will be performed. Individual OHI data will be loaded into DEERS 3.0 as beneficiaries first interact with the new system.

Before a CHCS site comes online with DEERS 3.0, they must synchronize all of their local OHI policies to the SIT keys.

Before a MCSC site comes online with DEERS 3.0, they must synchronize all of their local OHI policies to the SIT keys.

3.5.4. Precedent Requirements

The following are required load precedents for DEERS 3.0 OHI data:

- A person must exist in the DEERS 3.0 database before an OHI record can be loaded and associated to them.
- The SIT must contain a record for the OHI Carrier associated with an OHI record before that OHI record can be loaded into the OHI table in DEERS 3.0.

3.6. Standard Fiscal Year Catastrophic Cap and Deductible (CC&D)

3.6.1. Source

TMA-Aurora will provide TRICARE Standard fiscal year CC&D data in the form of the CDCF. DEERS will convert the CDCF totals of each beneficiary for each of the last three fiscal years.

Analysis is ongoing to determine if DEERS will convert the detail records of CDCF claims.

3.6.2. Target

The CC&D Detail table of DEERS 3.0 contains catastrophic cap and deductible information and serves as a central repository for CC&D data. The main purpose of the CC&D Detail table is to allow DEERS to maintain and provide current, accurate CC&D data for both individual and family beneficiaries to support TRICARE portability. In addition, the CC&D Detail table, along with the CC&D Total tables, will provide the MCSCs with the means to determine the status of CC&D amounts for DoD-eligible beneficiaries.

3.6.3. Process

The migration of Standard fiscal year CC&D data to DEERS 3.0 will involve the following procedures (refer to Figure 8 and Figure 9 for the process flow and data flow diagrams, respectively):

1. Export keys from DEERS 3.0 to the Master Key file (DEERS DBA).
2. Export CDCF CC&D totals data to a sequential export file (TMA-Aurora).
3. Reconcile DEERS 3.0 keys to CDCF CC&D data (conversion SE).
4. Convert CDCF CC&D data to the DEERS 3.0 CC&D Detail table format (conversion SE).
5. Generate error report files (conversion SE).
6. Error research and resolution (conversion SE, TMA-Aurora).
7. Create a sequential import file in the format of the DEERS 3.0 CC&D table (conversion SE).
8. Load the import file into the DEERS 3.0 CC&D Detail table (DEERS DBA).

Once the load step is finished, the following steps will occur.

- Execute data validation scripts on the DEERS 3.0 database tables after loading the import file (conversion SE).

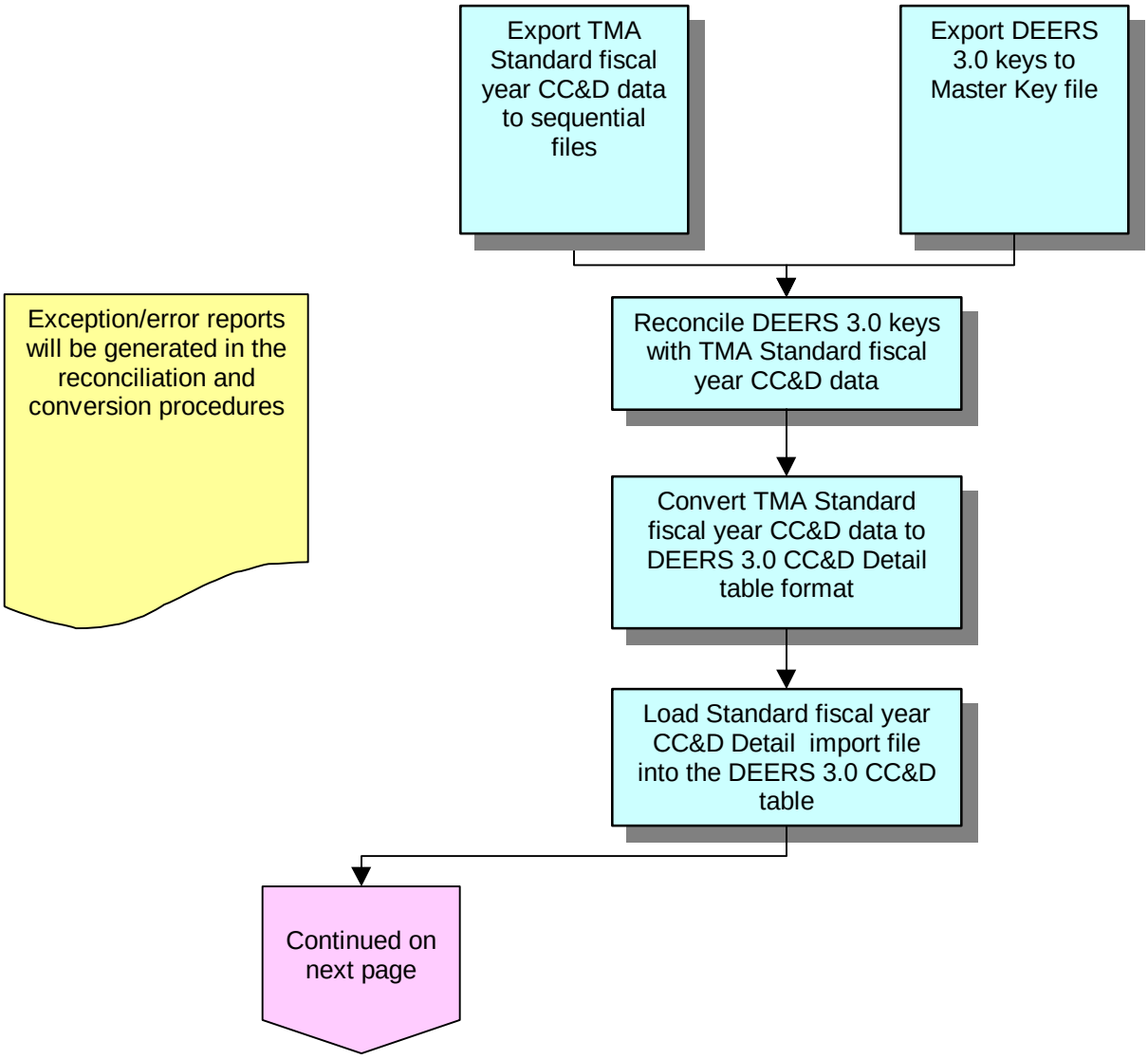
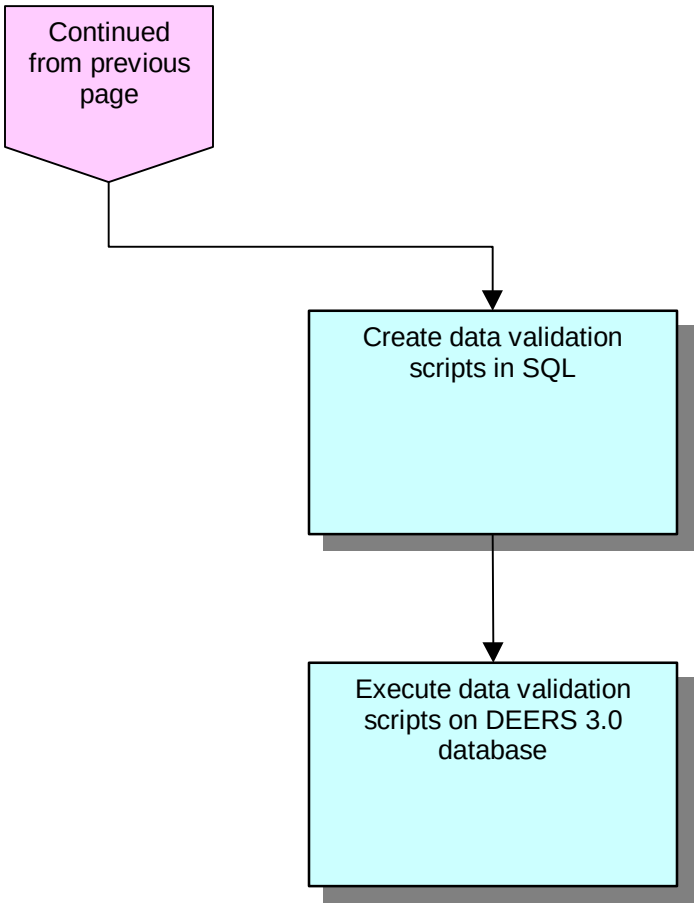


Figure 8 – Standard Fiscal Year CC&D Process Flow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Create data validation scripts in SQL
Execute data validation scripts on DEERS 3.0 database

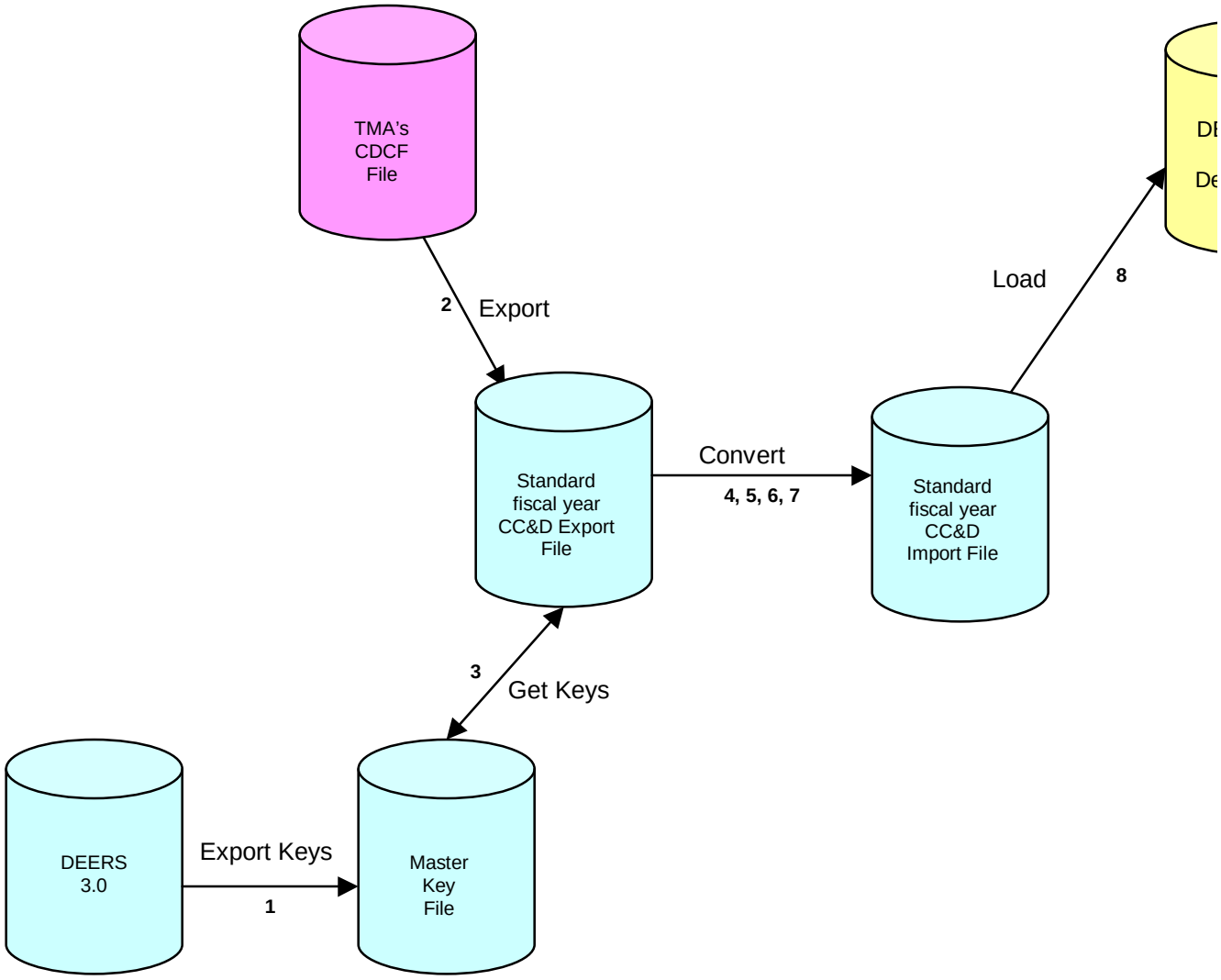


Figure 9 – Standard Fiscal Year CC&D Data Flow

- Research and resolve any discrepancies found in results from execution of data validation scripts (conversion SE, DEERS DBA, MCSCs).
- Execute delta change procedures to update DEERS 3.0 database with any changes that occur between the time of the conversion and the point at which DEERS 3.0 goes live (DEERS DBA). Analysis of delta change methodology and responsibilities is ongoing.

3.6.4. Precedent Requirements

The following are required precedents for loading Standard fiscal year CC&D data into the DEERS 3.0 CC&D Detail table:

- A beneficiary must exist in the DEERS 3.0 database before a CC&D Detail record can be loaded and associated to them.

3.7. Prime Enrollment Year Catastrophic Cap and Deductible (CC&D)

3.7.1. Source

The MCSCs will provide TRICARE Prime enrollment year CC&D data. DEERS will convert Prime enrollment year CC&D totals for each person for the current enrollment year.

3.7.2. Target

The CC&D Detail table of DEERS 3.0 contains catastrophic cap and deductible information and serves as a central repository for CC&D data. The main purpose of the CC&D Detail table is to allow DEERS to maintain and provide current, accurate CC&D data for both individual and family beneficiaries to support TRICARE portability. In addition, the CC&D Detail table, along with the CC&D Total tables, will provide the MCSCs with the means to determine the status of CC&D amounts for DoD-eligible beneficiaries.

3.7.3. Process

The migration of Prime enrollment year CC&D data to DEERS 3.0 will involve the following procedures (refer to Figure 10 and Figure 11 for the process flow and data flow diagrams, respectively):

1. Export keys from DEERS 3.0 to the Master Key file (DEERS DBA).
2. Export MCSC Prime enrollment year CC&D totals data to sequential export files (PGBA, WPS).
3. Reconcile DEERS 3.0 keys to MCSC Prime enrollment year CC&D data (conversion SE).
4. Reconcile MCSC Prime enrollment year CC&D data with the Prime Family Enrollment Year import file created during the HCDP migration process (conversion SE).
5. Convert MCSC Prime enrollment year CC&D data to the DEERS 3.0 CC&D Detail table format (conversion SE).
6. Generate exception/error reports (conversion SE).
7. Error research and resolution (conversion SE, MCSCs).
8. Create a sequential import file in the format of the DEERS 3.0 CC&D table (conversion SE).
9. Load the import file into the DEERS 3.0 CC&D Detail table (DEERS DBA).

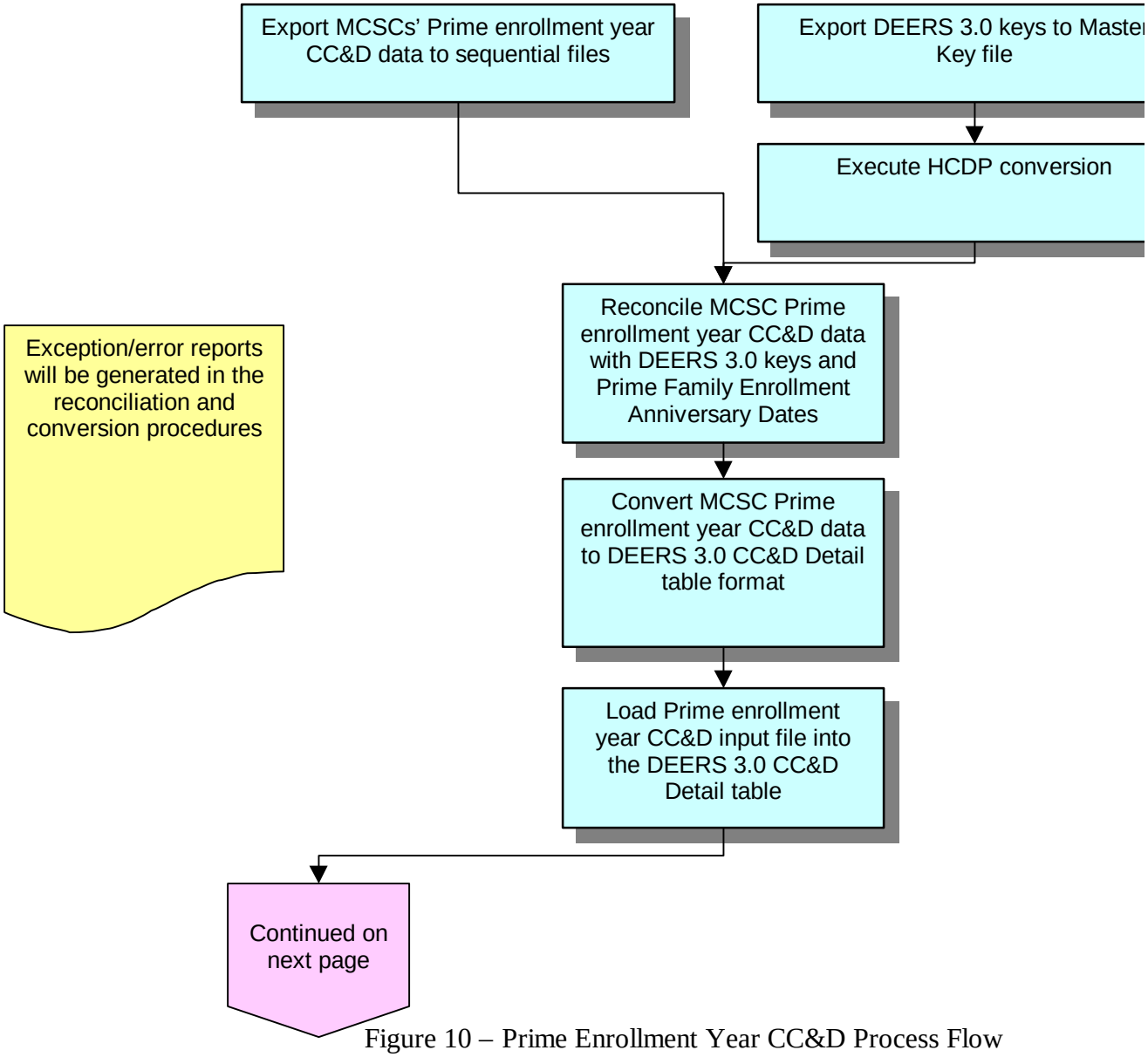
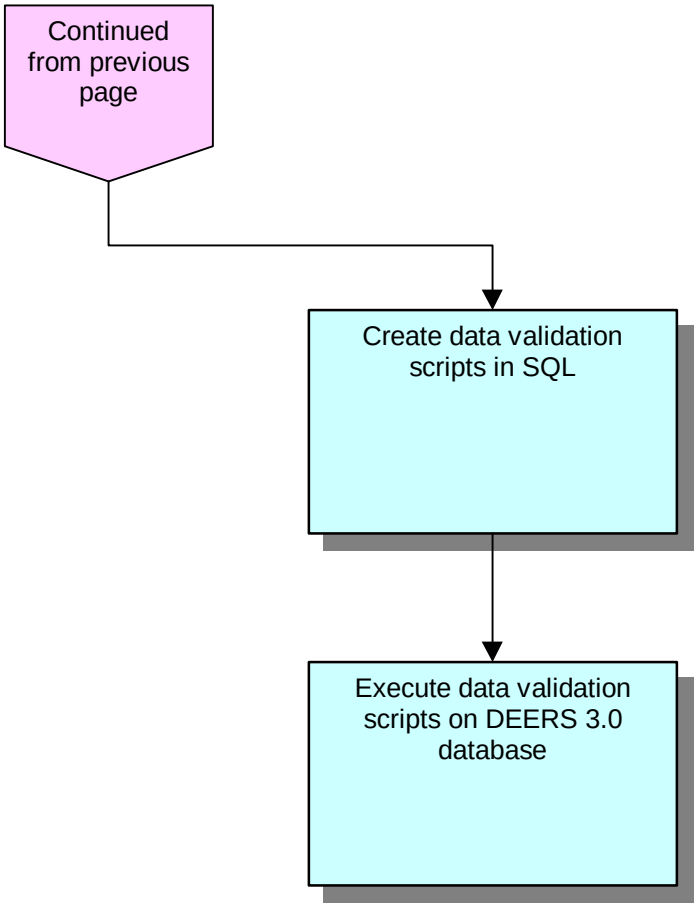


Figure 10 – Prime Enrollment Year CC&D Process Flow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Create data validation scripts in SQL
Execute data validation scripts on DEERS 3.0 database

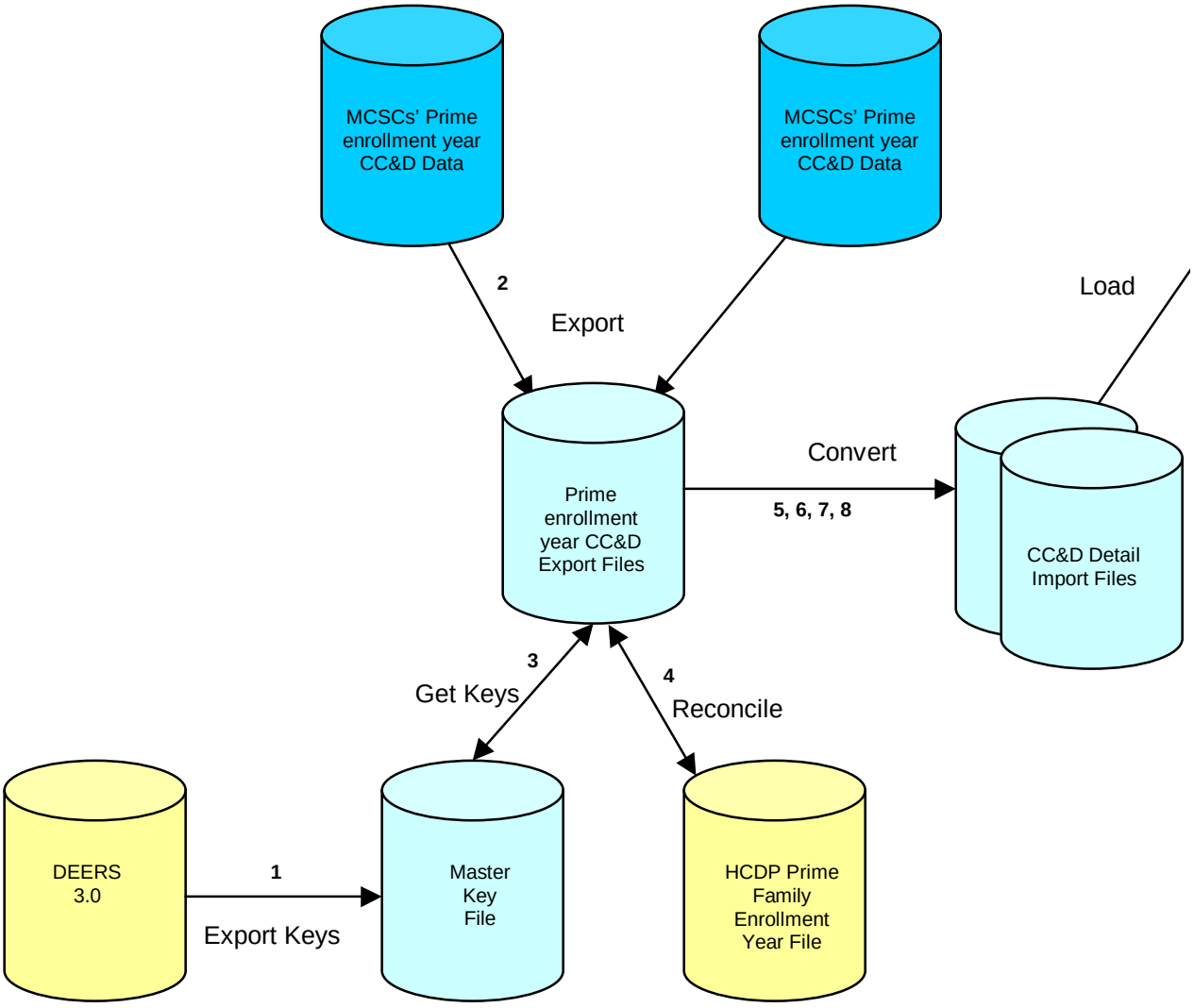

Figure 11 – Prime Enrollment Year CC&D Data Flow

Once the load step is finished, the following steps will occur.

- Execute data validation scripts on DEERS 3.0 database tables after loading the import files (conversion SE).
- Research and resolve any discrepancies found in results from execution of data validation scripts (conversion SE, DEERS DBA, MCSCs).
- Execute delta change procedures to update the DEERS 3.0 database with any changes that occur between the time of the conversion and the point at which DEERS 3.0 goes live (DEERS DBA). Analysis of delta change methodology and responsibilities is ongoing.

3.7.4. Precedent Requirements

The following represents required precedents for loading Prime enrollment year CC&D data into the DEERS 3.0 CC&D Detail table:

- A beneficiary must exist in the DEERS 3.0 database before a CC&D Detail record can be loaded and associated to them.
- A beneficiary must have a Prime Family Enrollment Anniversary Calendar Date before a Prime enrollment year CC&D Detail record can be loaded and associated to them.

4. Testing

4.1. Unit Testing

Testing will be done at the unit level for each program module. Some units may consist of other units, so some unit integration testing may take place during unit testing.

The MCSCs are responsible for providing test files of enrollment, fee payment, and Prime enrollment year CC&D data (formats detailed in data conversion specification documents) at all stages of the testing process.

TIMA-Aurora is responsible for providing test files of Standard fiscal year CC&D data (format to be detailed in the Standard Fiscal Year Catastrophic Cap and Deductible Data Conversion Specifications document) from the CDCF at all stages of the testing process.

4.1.1. Developing Unit Test Cases

The systems engineers (SEs) will develop test cases (in terms of inputs, expected results, and evaluation criteria), test procedures, and test data for testing the conversion programs corresponding to each software unit. The test cases will cover all aspects of the unit's detailed design. The SEs will record this information in the appropriate software development files.

4.1.2. Performing Unit Testing

The SEs will test the conversion programs corresponding to each software unit. The testing will be in accordance with the unit test cases and procedures.

4.1.3. Revision and Re-testing

Conversion/migration programs will be run through multiple iterations on various sets of data. The SEs will make all necessary revisions to the programs, perform all necessary re-testing, and update the software development files, based on the results of unit testing.

4.1.4. Analyzing and Recording Unit Test Results

The SEs will analyze the results of unit testing and will record the test and analysis results in the appropriate software development files. Conversion output files (containing data ready for load into the Oracle tables) will be examined field-by-field for accuracy of format and content. When necessary, test data will be created so that all possible scenarios are verified as being correctly handled.

4.1.5. Code Peer Review

A code peer review for each unit will be successfully completed before the beginning of unit integration testing.

4.2. Unit Integration Testing

Unit integration testing refers to testing the integration of two or more software units to ensure that they work together as intended, and continuing this process until all software units in the system/sub-system have been integrated and tested. Since units may consist of other units, some unit integration and testing may take place during unit testing. The testing procedures documented in this section are not meant to duplicate those activities.

4.2.1. Developing Unit Integration Test Cases

The SEs will develop test cases (in terms of inputs, expected results, and evaluation criteria), test procedures, and test data for conducting unit integration testing. The test cases will cover all aspects of the design, so that all possible scenarios are verified as being correctly handled. The SEs will record this information in the appropriate software development files.

4.2.2. Performing Unit Integration Testing

The SEs will perform unit integration testing. The testing will be in accordance with the unit integration test cases and procedures.

4.2.3. Revision and Re-testing

Conversion/migration programs will run through multiple iterations on various sets of data. The load of the sequential import files into DEERS 3.0 tables will be tested rigorously through multiple passes. SQL scripts will be executed against the new database to insure that the data has been properly targeted to correct personnel, and that referential integrity has been maintained. The SEs will make all necessary revisions to the software, perform all necessary re-testing, and update the software development files, based on the results of unit integration and testing.

4.2.4. Analyzing and Recording Unit Integration Test Results

The SEs will analyze the results of unit integration testing and will record the test and analysis results in appropriate software development files. Conversion output files (containing data ready for load into the Oracle tables) will be examined field-by-field for accuracy of format and content.

4.3. System Testing

System testing starts with interfaces between individual sub-system components and continues to testing increasingly larger groups of integrated subsystems. Individually tested programs and non-program components are tested as integrated functions to verify conformance to functional requirements.

4.3.1. Developing

Quality Assurance (QA) analysts will develop a system test plan, including test cases (in terms of inputs, expected results, and evaluation criteria), test procedures, and test data for conducting system testing. The test cases will cover all aspects of the data conversion design, so that all possible scenarios are verified as being correctly handled. The system test cases and test procedures will be reviewed with the SEs responsible for software design and development.

4.3.2. Performing System Testing

QA analysts will perform system testing. The testing will be in accordance with the system test cases and procedures.

4.3.3. Revision and Re-testing

Problems identified during system testing will be documented and tracked to closure. The SEs will make all necessary revisions to the software, perform all necessary unit re-testing, and update the software development files as needed, based on the results of system testing.

4.3.4. Analyzing and Recording System Test Results

The SEs will analyze the results of system testing and will record the test and analysis results in appropriate software development files. Conversion output files (containing data ready for load into the Oracle tables) will be examined field-by-field for accuracy of format and content.

4.4. System Integration Testing

System integration testing will involve a full data conversion simulation, including participation by the various entities involved in the migration to DEERS 3.0: the MCSCs, CHCS, and TMA-Aurora. This will occur seven months prior to the scheduled production go-live date and will assist with overall integration testing for the whole DEERS 3.0 system.

4.4.1. System Integration Data

The data for the system integration test will be live production data from the MCSCs, CHCS, and TMA-Aurora.

4.4.2. Developing System Integration Test Plan

QA analysts will develop a system integration test plan, including the procedures necessary to execute a full production data conversion simulation. The system test plan will be reviewed with the SEs responsible for software design and development.

4.4.3. Performing System Integration Testing

SEs will perform system integration testing. The testing will be in accordance with the system integration test plan procedures.

4.4.4. Revision and Re-testing

Problems identified during system integration testing will be documented and tracked to closure. The SEs will make all necessary revisions to the software, perform all necessary unit re-testing, and update the software development files as needed, based on the results of system integration testing.

4.4.5. Analyzing and Recording System Integration Test Results

SEs will analyze the results of system integration testing and record the test and analysis results. Problems identified will be documented and tracked to closure.

5. Reports

5.1. Exception Reports

It is rare for data to be completely clean, that is, free of errors, and this is particularly true in large databases. As such, not all data can be properly converted and migrated. The conversion modules will generate exception reports to point out where data problems exist so that they may be researched and corrected.

Data problems may be referential (such as a dependent without a sponsor), relational (such as a begin date occurring after a date of death), or value related (e.g., an invalid Provider Type Code). Though all errors will be reported, the decision to reject the record will be based on the severity of the error (i.e., do not migrate any of the data to the new database).

The exception reports will list all errors encountered in the conversion/migration. Each record in error will be printed with the key information necessary to identify it, along with an error code indicating the type of error involved. In addition, the report will flag all rejected records.

Note that these exception reports will be generated in the form of files.

5.2. Statistical Reports

The conversion modules will produce statistical reports which include the following information:

- Total number of records processed
- Total number of sponsor records processed
- Total number of dependent records processed
- Number of records successfully migrated
- Percentage of records successfully migrated
- Number of errors by type
- Error percentage by type
- Total error percentage

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6. Deliverables

The following are DMDC deliverables associated with the data conversion task:

- Health Care Delivery Program Conversion Specifications
- Standard Insurance Table Data Conversion Specifications
- Standard Fiscal Year Catastrophic Cap and Deductible Data Conversion Specifications
- Prime Enrollment Year Catastrophic Cap and Deductible Data Conversion Specifications

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7. Appendixes

7.1. Responsibility Matrix

The following matrix designates who is responsible for performing specific procedures.

Procedure	Group Responsible
Design and develop conversion programs	Conversion SEs
Develop unit integration test plans	Conversion SEs
Develop data conversion test description	QA, KB/Core
Develop system test plan	QA
Develop system integration test plan	QA
Create Master Key file	DEERS DBA
Export DEERS old eligibility alt-care data to export files	Conversion SE
Export current enrollment data to export files	MCSCs
Export current fee payment data to export files	MCSCs
Export legacy NAS data to NAS export file	Conversion SE
Create SIT export file	B&D
Export Standard fiscal year CC&D data to export file	TMA-Aurora
Export Prime enrollment year CC&D data to export files	MCSCs
Create HCDP assignment algorithm	DEERS Architect
Generate assigned HCDP data from DEERS 3.0 benefits export files using assignment algorithm	Conversion SE
Reconcile DEERS old eligibility alt-care export data and MCSCs' enrollment export data to DEERS 3.0 keys	Conversion SE

Procedure	Group Responsible
Reconcile DEERS old eligibility alt-care export data, MCSCs' enrollment export data, and assigned HCDP data and convert to DEERS 3.0 HCDP input file formats	Conversion SE
Research and resolve any errors or discrepancies found in the data during testing.	Conversion SE, DEERS DBA, MCSCs
Create sequential output files of HCDP data for MCSCs	Conversion SE
Reconcile DEERS old eligibility NAS data to DEERS 3.0 keys	Conversion SE
Convert NAS export data to DEERS 3.0 NAS import file format	Conversion SE
Convert B&D SIT export data to DEERS 3.0 OHI Carrier import file format	Conversion SE
Reconcile Standard fiscal year CC&D export data to DEERS 3.0 keys	Conversion SE
Convert Standard fiscal year CC&D export data to DEERS 3.0 CC&D Detail import file format	Conversion SE
Reconcile Prime enrollment year CC&D export data to DEERS 3.0 keys and Prime Family Enrollment Anniversary Dates	Conversion SE
Convert Prime enrollment year CC&D export data to DEERS 3.0 CC&D Detail import file format	Conversion SE
Load HCDP import files into DEERS 3.0 Oracle table	DEERS DBA
Load NAS import file into DEERS 3.0 Oracle table	DEERS DBA
Load SIT import file into DEERS 3.0 Oracle table	DEERS DBA
Load Standard fiscal year CC&D import files into DEERS 3.0 Oracle table	DEERS DBA
Load Prime enrollment year CC&D import files into DEERS 3.0 Oracle table	DEERS DBA

Procedure	Group Responsible
Execute data validation scripts on DEERS 3.0 database table after loading the import files	Conversion SE
Research and resolve any discrepancies found in results from execution of data validation scripts	Conversion SE, DEERS DBA, MCSCs
Execute delta change procedures to update DEERS 3.0 database with any changes that occur between the time of the conversion and the point at which DEERS 3.0 goes live	Conversion SE, DEERS DBA, MCSCs
Perform unit testing	Conversion SE
Perform unit integration testing	Conversion SEs
Perform Model Office preliminary system test	QA, C/S GUI
Perform system testing	QA, KB/Core
Perform integration testing with MCSCs and CHCS	QA, KB/Core, MCSCs, CHCS
Perform data conversion for production	Conversion SEs, DEERS DBA, MCSCs, TMA-Aurora

7.2. DEERS 3.0 High Level Data Model